

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 5024 (1968): Buffalo-butt leather for knee bushings [CHD
17: Leather, Tanning Materials and Allied Products]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



IS : 5024 - 1968
(Reaffirmed 1981)

Indian Standard
SPECIFICATION FOR BUFFALO-BUTT
LEATHER FOR KNEE BUSHINGS
(First Reprint MARCH 1985)

UDC 675.061.11:615.477.2



© Copyright 1969

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG

NEW DELHI 110002

Gr 3

May 1969

Indian Standard

SPECIFICATION FOR BUFFALO-BUTT LEATHER FOR KNEE BUSHINGS

Leather Sectional Committee, CDC 16

<i>Chairman</i>	<i>Representing</i>
DR Y. NAYUDAMMA	Council of Scientific and Industrial Research, New Delhi
<i>Members</i>	
SHRI R. K. AGARWAL	Directorate of Industries, Government of Uttar Pradesh, Kanpur
DR G. D. PANDE (<i>Alternate</i>)	
SHRI M. BANERJEE	Commerce and Industries Department, Government of West Bengal, Calcutta
SHRI R. A. BHOTE	Directorate of Marketing and Inspection (Agriculture), Nagpur
SHRI T. G. BOBADE	Ministry of Defence (DGI)
SHRI A. NAGAPPA CHETTIAR	Leather Export Promotion Council, Madras
SHRI T. ABDUL WAHID (<i>Alternate</i>)	
SHRI O. P. DHAMJA	Export Inspection Council of India, Calcutta
SHRI V. N. SRIVASTAVA (<i>Alternate</i>)	
SHRI T. N. GANJWAR	The India Leather Corporation Private Ltd, Madras
SHRI J. GHOSH	State Trading Corporation of India Ltd, New Delhi
SHRI A. K. SEN (<i>Alternate</i>)	
SHRI S. R. KOCHHAR	Directorate General of Supplies & Disposals, (Inspection Wing), New Delhi
SHRI A. K. PRAMANICK (<i>Alternate</i>)	
SHRI B. MILNER	Gordon, Woodroffe Leather Manufacturing Co Private Ltd, Madras
SHRI G. P. MADHAWAN (<i>Alternate</i>)	
SHRI S. N. MUKHERJEE	The British India Corporation Ltd, Kanpur
SHRI K. V. S. MURTHI	Planning Commission, New Delhi
SHRI S. NAGARAJAN	Development Commissioner, Small Scale Industries, New Delhi
SHRI NASIM IQBAL	The Tanners' Federation of India, Kanpur
SHRI G. ROY CHOUDHURY	Export Promotion Council for Finished Leather and Leather Manufactures, Kanpur
SHRI P. K. SARKAR	Indian Leather Technologists' Association, Calcutta
SHRI N. R. SARKAR	Bata Shoe Co Pvt Limited, Calcutta
SHRI V. LEITENEDORFER (<i>Alternate</i>)	
SHRI SANJOY SEN	The National Tannery Co Ltd, Calcutta
SHRI J. SINHA ROY (<i>Alternate</i>)	
SHRI P. R. SONDHI	Kapurthala Northern India Tanneries Ltd, Kapurthala
SHRI R. R. SONDHI (<i>Alternate</i>)	

(Continued on page 2)

(Continued from page 1)

Members

SHRI R. THANJAN

SHRI R. S. GHOSH (Alternate)

SHRI D. DAS GUPTA,
Director (Chem)

Representing

Directorate General of Technical Development,
New Delhi

Director General, ISI (*Ex-officio Member*)

Secretary

SHRI N. R. SRINIVASAN
Deputy Director (Chem), ISI

Orthopaedic Leather Subcommittee, CDC 16 : 11

Convener

SHRI P. S. VENKATACHALAM

Central Leather Research Institute (CSIR),
Madras

Members

SHRI W. G. EDGAR

SHRI JOHN GIRLING

DR M. NATRAJAN

**SUPERINTENDENT, ARTIFICIAL
LIMB WORKSHOP (Alternate)**

SHRI S. R. SAHA

SHRI N. SWARUP

Ministry of Defence (DGI)

Christian Medical College, Vellore

Government General Hospital, Madras

College of Leather Technology, Calcutta
Occupational Therapy Institute, New Delhi

Indian Standard

SPECIFICATION FOR BUFFALO-BUTT LEATHER FOR KNEE BUSHINGS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 18 December 1968, after the draft finalized by the Leather Sectional Committee had been approved by the Chemical Division Council.

0.2 Leather for knee bushings should be uniform in substance, fibrous, free from extraneous matter as far as possible and sufficiently resilient to produce a cushioning effect on the knee joint of the limb, as its essential function is that of a packing material. Taking the above points into consideration it has been found by experience that indigenously available buffalo-butts, tanned with formaldehyde are suitable for this purpose.

0.3 Knee bushing is fitted into a hole in the knee block. The knee joint may be up to 30 cm away from the bottom of the stump. Before placing the leather bushing into the wooden knee block, tallow is applied liberally on the inside of the bushing and the outside is covered with glue.

0.4 This standard contains clause 5.2 which calls for agreement between the purchaser and the supplier.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS: 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements, methods of sampling and test for butt leather processed from buffalo hide and used for knee bushings in orthopaedic appliances.

2. TERMINOLOGY

2.1 For the purpose of this standard the definitions given in IS : 1640-1960† shall apply.

*Rules for rounding off numerical values (revised).

†Glossary of terms relating to hides, skins and leathers.

3. GRADES

3.1 This specification covers three grades of buffalo-butt leather, namely, Grade 1, Grade 2 and Grade 3.

3.1.1 Grade 1 — Shall be in the form of butts free from defects like holes, scratches, scars, butcher-cuts and other visible blemishes both in the grain and flesh.

3.1.2 Grade 2 — Shall be in the form of butts as Grade 1 except that it may carry not more than two defects described in 3.1.1.

3.1.3 Grade 3 — Shall be in the form of butts as in Grade 1 but it may carry not more than five defects as described in 3.1.1.

4. REQUIREMENTS

4.1 Raw Material — The leather shall be processed from the butt portion of buffalo hides that are likely to yield ultimately leathers of thickness 3.2 to 3.3 mm.

4.2 Tanning — The material shall be tanned with formaldehyde.

NOTE — The nature of the tannage may be qualitatively tested as follows:

‘A strip of leather when boiled in hot water undergoes shrinkage more or less, depending upon the extent of tannage. If this leather is now put in cold water, shape of leather is regained to a large extent. In the case of other tannages and dry hides, this shrinkage in boiling water cannot be reversed. The shrinkage in boiling water and its coming back to original shape in cold water may be repeated more than once and is typical for formaldehyde tannage.’

4.2.1 The hides may be pickled, pretanned or post-tanned with salts of aluminium to improve the whiteness and compactness of the final leather. The aluminium content (as Al_2O_3) in each leather, when tested according to the method given in A-2, shall not exceed 0.5 percent by weight on the finished leather.

4.3 Optical Whitener and White Fillers — These may be used to a limited extent so long as they do not cause skin irritation, chafing, dermatitis or any other skin disease when the treated leather comes into contact with human skin.

4.4 Chemical and Physical Requirements — The material shall comply with the requirements given in Table 1.

4.5 Size and Shape — The material shall be supplied in the form of full butts trimmed free of toggle, punch and nail marks.

5. MARKING AND PACKING

5.1 Marking — The buffalo-butt shall be marked with the grade, weight in kg and area in dm^2 .

**TABLE 1 REQUIREMENTS FOR BUFFALO-BUTT LEATHER
FOR KNEE BUSHINGS**

(Clause 4.4)

SL No.	CHARACTERISTIC	REQUIREMENTS FOR GRADES 1, 2 and 3	METHOD OF TEST, REF TO	
			CL No. OF IS: 582-1954*	APPEN- DIX A
(1)	(2)	(3)	(4)	(5)
i)	Moisture, percent by weight, <i>Max</i>	20	6	—
ii)	Oils and fats, percent by weight, <i>Max</i>	1.0	8	—
iii)	Insoluble ash, percent by weight, <i>Max</i>	2.0	12	—
iv)	Water solubles, percent by weight, <i>Max</i>	3.5	—	A-3
v)	pH of water solubles	6 to 8	—	A-4
vi)	Hide substance, percent by weight, <i>Min</i>	70	16	—
vii)	Formaldehyde, percent by weight, <i>Min</i>	0.1	—	A-5
viii)	Shrinkage temperature, °C, <i>Min</i>	80	—	A-6

*Methods of sampling and test for vegetable and chrome tanned leathers.

5.2 Packing — The buffalo-butts shall be packed as agreed to between the purchaser and the supplier.

5.2.1 The package shall be marked with the name of the manufacturer; recognised trade-mark, if any; grade; number of butts, area in dm² and weight in kg of butts; batch number, month and year of manufacture.

5.2.2 The packages may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

6. SAMPLING AND CRITERIA FOR CONFORMITY

6.1 Scale of Sampling — Samples for ascertaining conformity of the material shall be taken out in accordance with the procedure prescribed in IS : 582-1954*.

*Methods of sampling and test for vegetables and chrome tanned leathers.

5.2 Position of Sampling

6.2.1 Sampling Position for Chemical Tests — Sampling position for carrying out chemical tests shall be as prescribed in IS : 582-1954*.

5.3 Examination for Visual Requirements — All the pieces in the samples selected from a lot shall be individually examined for each of the visual requirements, such as finish, size and shape. If any piece is found to be defective in any of the visual requirements, the entire lot shall be screened in respect of the visual requirements in order to remove all the defective pieces from the lot.

5.4 Tests for Chemical Requirements — If the lot has been found satisfactory in respect of visual requirements, it shall be subjected to the tests of all other requirements of this specification.

6.5 Criteria for Conformity — The lot shall be declared to have met the requirements of this specification if all the test results, obtained by following the specified testing procedure, satisfy the relevant requirements of this specification.

7. TEST METHODS

7.1 Carry out tests regarding moisture, oils and fats, insoluble ash and side substance in accordance with the method prescribed in IS : 582-1954*.

7.2 Determine aluminium content, water solubles, pH of water solubles, free formaldehyde and shrinkage temperature in accordance with the relevant methods of test prescribed in Appendix A.

APPENDIX A

(*Clauses 4.2.1 and 7.2, and Table 1*)

TEST METHODS

1. QUALITY OF REAGENTS

1-1.1 Unless specified otherwise, 'pure chemicals' and distilled water *see* IS : 1070-1960†) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

*Methods of sampling and test for vegetables and chrome tanned leathers.

†Specification for water, distilled quality (*revised*).

A-2. DETERMINATION OF ALUMINIUM AS ALUMINA (Al_2O_3)

A-2.1 Outline of the Method — In this method an aluminium tartrate complex is formed. When treated in slightly basic solution with potassium fluoride this liberates an amount of base equivalent to the aluminium present, which can then be titrated.

A-2.2 Apparatus

A-2.2.1 Conical Flask — 100 ml capacity.

A-2.2.2 Hot-Plate

A-2.2.3 Muffle Furnace — provided with pyrometer and thermostatic control.

A-2.3 Reagents

A-2.3.1 Concentrated Hydrochloric Acid — conforming to IS : 265-1962*.

A-2.3.2 Thymol Blue and Cresol Red Indicator — Prepared by mixing 3 volumes of 0.1 percent alcoholic solution of thymol blue and one volume of 0.1 percent alcoholic solution of cresol red.

A-2.3.3 Potassium Hydroxide Solution — approximately 5 N.

A-2.3.4 Potassium Tartrate Solution — approximately 50 percent solution neutralized to indicator as given in **A-2.3.2**.

A-2.3.5 Potassium Fluoride Solution — approximately 20 percent solution neutralized to indicator as given in **A-2.3.2**.

A-2.3.6 Standard Hydrochloric Acid Solution — 0.1 N.

A-2.4 Procedure

A-2.4.1 Ash 1 to 2 g of the material, accurately weighed, at 600°C in a crucible in a muffle furnace. Lixivate the ash with 5 to 10 ml of concentrated hydrochloric acid and then with water. Transfer the contents to a conical flask, and heat on a hot-plate in a fume chamber till the volume is reduced to 5 ml. Add few drops of the mixed thymol blue-cresol red indicator solution and neutralize the excess of acid with potassium hydroxide solution indicated by disappearance of red colour. Cool the solution and add 20 ml of potassium tartrate solution and complete the neutralization of the acid with potassium hydroxide solution indicated by the appearance of pink colour. Subsequently add 20 ml of potassium fluoride solution and titrate with standard hydrochloric acid. The end point is reached when the solution assumes the same pink colour which goes over to orange-yellow with further addition of acid.

*Specification for hydrochloric acid (revised).

A-2.5 Calculation

$$\begin{array}{l} \text{Aluminium (as Al}_2\text{O}_3 \text{),} \\ \text{percent by weight} \end{array} = \frac{1.7 \, VN}{W}$$

where

V = volume in ml of standard hydrochloric acid required for the titration,

N = normality of standard hydrochloric acid, and

W = weight in g of the sample taken for the test.

A-3. DETERMINATION OF WATER SOLUBLES

A-3.1 Outline of the Method—A weighed quantity of the material is freed from fats and oils and extracted with cold water for a specified time. The aqueous extract is then evaporated to determine water solubles.

A-3.2 Apparatus

A-3.2.1 Glass Bottle—a wide-mouthed glass bottle of 1 litre capacity with a suitable rubber bung.

A-3.2.2 Mechanical Shaker—power driven mechanical shaker having a speed of 55 to 60 rpm and having provision to fit the wide-mouthed glass bottle.

A-3.3 Weigh accurately about 10 g of the material. Extract with petroleum hydrocarbon solvent to completely free it from free fats and oils. Spread it out on a clean surface and leave it exposed to air. (Do not heat it in an air oven or water bath). Transfer the material to a wide-mouthed bottle, add 500 ml of distilled water, cork the bottle with the rubber bung and shake in a mechanical shaker for exactly two hours. Separate the liquid from the residual leather by filtration through Whatman Gravimetric filter paper and evaporate an aliquot portion of the filtrate (50 ml) in a tared porcelain basin on a water-bath. Dry to constant weight at 100°C in an air-oven.

A-3.4 Calculation—Calculate the water solubles as follows:

$$\text{Water solubles, percent by weight} = 100 \times W$$

where

W = weight of residue, that is the difference in weight of the basin before and after the experiment.

A-4. DETERMINATION OF pH OF WATER SOLUBLES

A-4.1 Determine the pH of the water solubles from A-3.3 electrometrically with the help of a pH meter, fitted with glass electrodes to read the prescribed limits.

A-5. DETERMINATION OF FORMALDEHYDE

A-5.1 Outline of the Method — A known quantity of the leather is hydrolyzed with sulphuric acid, the total formaldehyde liberated is distilled over and estimated iodimetrically.

A-5.2 Apparatus

A-5.2.1 Kjeldahl Flask — 500 ml capacity.

A-5.3 Reagents

A-5.3.1 Dilute Sulphuric Acid — 2 N.

A-5.3.2 Sodium Bisulphite Solution — 1.2 percent (w/v).

A-5.3.3 Standard Iodine Solution — approximately N/10.

A-5.3.4 Starch Solution — Triturate 5 g of starch and 0.01 g of mercuric iodide with 30 ml of water in a mortar. Pour the resulting paste into one litre of boiling water, boil for three minutes, allow the solution to cool and decant off the clear liquid.

A-5.4 Procedure — Take 2 g of the material, accurately weighed, in Kjeldahl flask and add 100 ml of dilute sulphuric acid and distil the content for 45 minutes. Collect the distillate into a receiver containing 20 ml of sodium bisulphite solution. Titrate the solution with iodine solution using starch solution as the indicator. Then add 10 to 20 ml of sodium carbonate solution and titrate the contents again with iodine solution and record this titre value in millilitres (V).

A-5.5 Calculation — Calculate the formaldehyde content as follows:

$$\text{Formaldehyde, percent by weight} = \frac{V \times N \times 1.5}{W}$$

where

V = volume in ml of standard iodine solution required for the titration,

N = normality in N of standard iodine solution, and

W = weight in g of the material taken.

A-6. TEST FOR SHRINKAGE TEMPERATURE

A-6.1 Principle of the Method — The thermal stability of the leather depends on the nature and extent of tannage and consequently shrinkage temperature is a direct measure of the same.

A-6.2 Apparatus

A-6.2.1 Beaker — one litre capacity.

A-6.2.2 Clamps — two suitable clamps to hold the test piece. The upper clamp shall be capable of moving and lower clamp shall be stationary.

A-6.2.3 Heating Device

A-6.2.4 Indicating Device — An indicating device which keeps the test piece in position and accurately detects and magnifies by at least 25 times any shrinkage or swelling of the test piece. In no case the device shall cause an elongation of more than ten percent of the test piece prior to shrinkage.

A-6.2.5 Stirrer — a mechanical stirrer.

A-6.2.6 Thermometer — a thermometer reading up to 150°C.

A-6.3 Procedure

A-6.3.1 Preparation of Test Piece — Cut from the relevant portion (see 6.2.1) a rectangular piece 10×60 mm.

A-6.3.2 Mount the clamp one over the other 50 mm apart, with the bottom one stationary. Attach the indicating device to the upper (movable) clamp. Place the test piece in the clamp, completely immersed in the water at $27^{\circ} \pm 2^{\circ}\text{C}$ and allow it to remain until the water has thoroughly penetrated it. Adjust the indicator to a reference or zero point so that the eventual shrinkage may be readily detected. Stir the water while being heated at a rate of 3° to 5°C per minute.

NOTE — Adjust the indicator to a reference or zero point again if the test piece swells with rise in temperature.

A-6.4 Report — Record the temperature of the water at which the test piece begins to shrink.

INDIAN STANDARDS INSTITUTION

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110002

Telephones : 26 60 21, 27 01 31

Telegrams : Manaksanstha (Common to all Offices)

Regional Offices:

Telephone

*Western	: Manakalaya, E9 MIDC, Marol Andheri (East) BOMBAY 400093	6 32 92 95
†Eastern	: 1/14 C. I. T. Scheme VII M V. I. P. Road, Maniktola CALCUTTA 700054	36 24 99
Southern	: C. I. T. Campus MADRAS 600113	41 24 42
Northern	: B69 Phase VII Industrial Focal Point S. A. S. NAGAR 160051 (Punjab)	8 73 28

Branch Offices:

'Pushpak', 3rd Floor, Nurmohamed Shaikh Marg, Khanpur AHMADABAD 380001	{ 2 63 48 2 63 49
'F' Block, Unity Bldg, Narasimharaja Square BANGALORE 560002	22 48 05
Gangotri Complex, (6th Floor), Bhadbhada Road, T. T. Nagar BHOPAL 462003	6 27 16
22E Kalpana Area BHUBANESHWAR 751014	5 36 27
5-8-56C L. N. Gupta Marg HYDERABAD 500001	22 10 83
R14 Yudhister Marg, C Scheme JAIPUR 302005	6 98 32
117/418 B Sarvodaya Nagar KANPUR 208005	4 72 92
Patliputra Industrial Estate PATNA 800013	6 23 05
Hantex Bldg (2nd Floor), Railway Station Road TRIVANDRUM 695001	32 27

Inspection Office (with Sale Point):

Institution of Engineers (India) Building 1332 Shivaji Nagar PUNE 411007	5 24 35
--	---------

*Sales Office in Bombay is at Novelty Chambers, Grant Road BOMBAY 400007	89 65 28
--	----------

†Sales Office in Calcutta is at 5 Chowringhee Approach, P.O. Princep Street CALCUTTA 700072	27 68 00
--	----------